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Effect of rational exercise on delaying brain aging and its mechanism analysis

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Objective Aging is an inevitable rule in the process of life. When human growth and development mature, with the increase of age, the organs and organs of the body will have functional and morphological degenerative changes. China has now entered an aging society, and the aging related diseases are increasing, and the aging of the brain and related diseases are one of the main reasons for the decline of the quality of life of the elderly. It is particularly important to study methods of delaying brain aging. The development of physical exercise to promote the development of brain health has become a hot spot. Appropriate exercise can effectively improve the normal physiological function of the hippocampus neurons, delay the aging process of the central nervous system, and explore the effect of physical exercise on the brain senescent patients and its mechanism of action is very necessary.
Methods Through the retrieval of Chinese knowledge network, Wanfang Data knowledge service platform, VVP cube knowledge discovery system, 100 chain database collection sports related research literature on brain senescence, collating literature information, in-depth integration of literature, analysis of the effect of physical exercise on brain aging and mechanism.
Results (1) The brain is the most advanced part of the central nervous system, and the structure and function of the brain are very complex, and each brain region bears the corresponding function, in which the hippocampus is considered to be related to the learning and memory function. The aging of the central nervous system plays a leading role in the aging of the body, and its pathological changes are mainly found in the cerebral cortex and hippocampus. After the growth of the mature period, the myelin development in the brain is damaged, the brain myelin development is damaged, the nerve cells atrophy, the intracellular lipofuscin accumulates, the synaptic connections and the neurotransmitters decrease, and the ability to accept and transmit information is reduced, and the specific expression is reaction retardation, intelligence, learning, memory, analysis, judgment and push. The attenuation of the ability to be reasonable. Brain senescence is often accompanied by changes in brain weight, brain nerve cells, nerve fiber conduction velocity and brain cell dysfunction. It is a complex process, and any single factor can not explain its mechanism. In recent years, with the rapid development and promotion of molecular biology and cell biology, great progress has been made in the study of aging, and some theories about aging are put forward. The mechanism of aging of brain mainly includes the following theories: the free radical damage theory, the theory of genetic mutation, the theory of end grain loss, the theory of mitochondria, and the protein. Qualitative change theory, waste accumulation theory, aging network theory and so on. At present, free radical damage and telomere theory are widely recognized. In recent years, nonenzymatic glycosylation has also made great progress.
(2) The hippocampus, the marginal system in the nervous system, is an important brain area for learning and memory. It plays a key role in the memory of various new knowledge, and the brain senescence is closely related to it. Aging related memory changes were positively correlated with activity changes in the two brain regions of the prefrontal cortex and hippocampus. In the hippocampus, dentate gyrus is the most serious subregion affected by aging. The hippocampus and prefrontal cortex are highly susceptible to aging. Therefore, the ability of brain control tasks will decrease correspondingly with the increase of age. The cerebral cortex is the high pole center of the

human body's functional activities, is the area where neurons are concentrated, and is the material basis of people's thinking activities. The cerebral cortex analyses and synthesizes various stimuli from the internal and external environment of the body, produces sensations, thoughts, and establishes language and governing actions. The cerebral cortex, as part of the brain tissue, also enters the old age with aging.

(3) Appropriate exercise can improve the state of brain senescence to a certain extent, and even reverse the decrease of the number of peripheral nerve terminal branches caused by aging. The effect of exercise intensity and duration on the hippocampus is very important. The exercise that has protective effects on the hippocampus is usually a small intensity and longer duration of exercise. Long term exercise can reverse the loss of the cholinergic fibers in the senescence process and promote the lateral shoots, and the content of synaptophysin in the hippocampus follows the age of age. Decline, long term exercise can delay the decrease of synaptophysin, promote the increase of neurons and the proliferation of dendrites, clarify the mechanism of motion retarding the aging effect of brain, and postpone brain senescence to promote the compensatory effect of the structure of central nervous system (CNS).

(4) Exercise is one of the means to interfere with the aging of the brain. It is observed by electrical stimulation that some regions of the cerebral cortex have a close relationship with physical movement. Electrical stimulation of some regions of the cerebral cortex can cause some muscle contraction in certain parts of the cerebral cortex, and exercise can increase the thickness of the cerebral cortex. Increase the nerve cell dendrites of the brain. Exercise can promote the dynamic balance of free radical metabolism, enhance the ability to clear free radicals in the body, enhance the antioxidant capacity of the cerebral cortex, and improve the antioxidant capacity of brain cells.

(5) Reasonable exercise can promote metabolism, enhance vitality, improve cardiovascular function and enhance immunity. Exercise can also protect animals from premature death, thereby prolonging the survival time of animals. The study of the effect of exercise on the peripheral nervous system shows that long term exercise can delay the morphological changes of the senescence related neuromuscular junction (NMJ) in rodents, promote the release of neurotransmitters in the end of exercise, and even reverse the decline of the age related peripheral nerve terminal branches. Exercise can improve psychomotor dysfunction with age by delaying the decline of age-related dopamine system function. Long-term moderate exercise can reduce the loss of neurons in the anterior horn of the spinal cord in the process of aging, and motor has a protective effect on neurons. Moreover, exercise can improve spatial learning behavior, and clearly shows the positive role of exercise in the prevention and treatment of brain aging. Exercise with different loads has a certain effect on scavenging free radicals in the brain and reducing lipid peroxidation level in the brain, thus delaying brain aging.

Conclusions Hippocampus and prefrontal cortex are particularly susceptible in many regions of aging. Appropriate exercise can improve the state of brain senescence to a certain extent, and even reverse the decrease in the number of peripheral nerve terminal branches caused by aging. Looking at the history of the study of the action of the motion to the organism, it can be seen that there are two obvious trends in the study. One is the function of the movement to the system of the circulation system, the immune system of the motion system, and the two is the whole organ and molecule level of the movement. Therefore, only after a comprehensive understanding of the molecular mechanism of the action of the movement on the central nervous system, it is possible to fully and accurately elucidate the mechanism of action, and only in this way can we establish the position of motion in delaying brain aging.